

# Graphing Quadratics Review

Name Key Hr \_\_\_\_\_

## REPRESENTATIONS (30 Points)

**Part 1: For problems 1 – 4, match the equations with the graphs:**

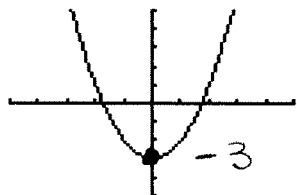
1. D  $y = x^2$

2. A  $y = x^2 - 3$

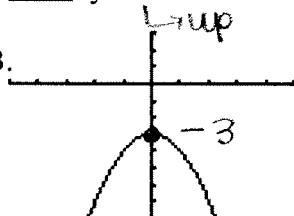
3. C  $y = x^2 + 3$

4. B  $y = -x^2 - 3$  down

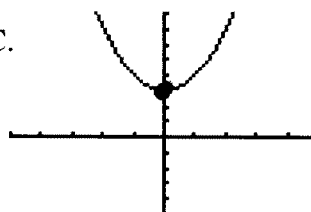
A.



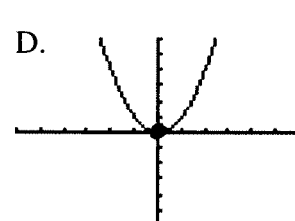
B.



C.



D.



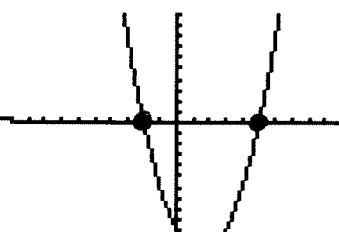
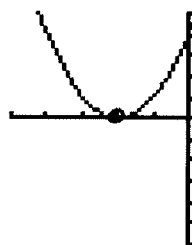
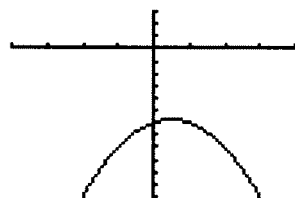
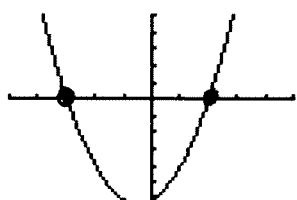
**Part 2: What are the roots of these parabolas? If it doesn't hit the x-axis, write NRS (No Real Solution)**

5.  $x = -3, x = 2$

6. NRS

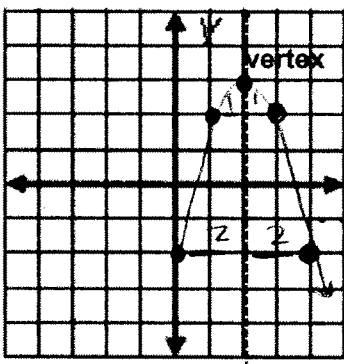
7.  $x = 3$

8.  $x = -2, x = 5$

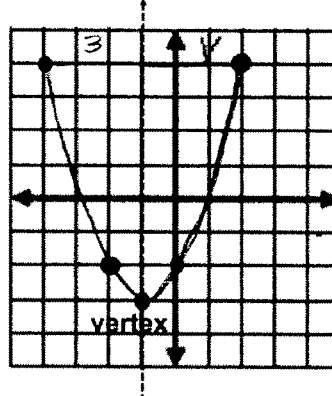


**Part 3: Based on the vertex and axis of symmetry, mark in TWO other points on the parabola.**

9.)



10.)



## Part 4

**Graph these equations:**

11.  $y = x^2 - 6x + 8$

Work for vertex:  $x = \frac{-b}{2a} = \frac{6}{2(1)} = \frac{6}{2} = 3$

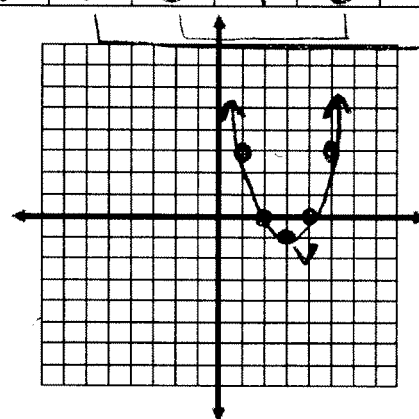
$y = (3)^2 - 6(3) + 8$   
 $9 - 18 + 8 = -1$

Work for the other coordinates:

$y = (2)^2 - 6(2) + 8 \rightarrow \text{same when } x = 4$   
 $4 - 12 + 8 = 0$

$y = (1)^2 - 6(1) + 8 \rightarrow \text{same when } x = 5$   
 $1 - 6 + 8 = 3$

	Vertex				
x	1	2	3	4	5
y	3	0	-1	0	3



12.  $y = (x+2)^2 - 3 \rightarrow$  same  
opposite

Work for the other coordinates:

$$y = (-1+2)^2 - 3$$

$$(1)^2 - 3$$

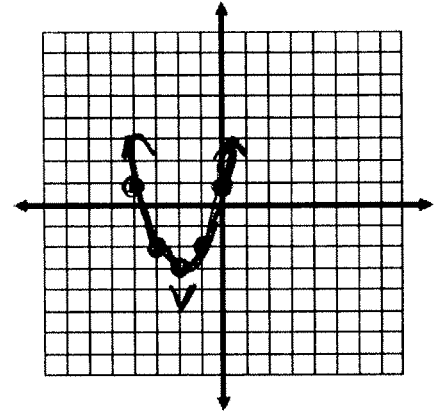
$$1 - 3 = -2$$

$$y = (0+2)^2 - 3$$

$$2^2 - 3 = 1$$

Vertex:  $(-2, -3)$

x	-4	-3	-2	-1	0
y	1	-2	-3	-2	1



**CONNECTIONS (10 Points): Show your work when solving each problem.**

13.) You launch a firework into the air at a speed of 45 meters per second. The height of the firework at a certain time (t) can be found with the equation:  $h = -5t^2 + 45t$

What is the **maximum height** of the firework?

$$x = \frac{-b}{2a} = \frac{-45}{2(-5)} = \frac{-45}{-10} = 4.5 \text{ sec}$$

$$h = -5(4.5)^2 + 45(4.5)$$

$$= 101.25 \text{ meters}$$

14.) You drop a water balloon from a window on the second floor of a building (36 feet). The height of the balloon can be found with the equation:  $h = -16t^2 + 36$

**When** will the balloon hit the ground below?

$$h = 0$$

$$0 = -16t^2 + 36$$

$$-36 = -16t^2$$

$$\frac{-36}{-16} = \frac{-16t^2}{-16}$$

$$\frac{36}{16} = t^2$$

$$\sqrt{\frac{36}{16}} = \sqrt{t^2}$$

$$\frac{6}{4} = t$$

$$1.5 = t$$

$$\text{sec}$$

1.5 seconds

15.) The graph on the right shows the height of a diver after a time in seconds.

a.) What is the **starting height** of the diver?  $t = 0$

12 feet

b.) What is the **maximum height** of the diver?

h = 13 feet

c.) When does the diver hit the water?

3 seconds

d.) When is the diver a height of **5 feet above** the water?

2.5 seconds

